REVENDICATIONS

1. An electroluminescent device (1) of the type comprising first (14) and second (5) mirrors substantially parallel and framing converting means (7) of electron-hole pairs into photons, and electron and holes generating means (6,8), characterised in that said converting means (7) and the first (14) and second (5) mirrors are arranged so as to ensure containment between said first (14) and second (5) photon mirrors presenting at least a selected wavelength associated to a guided propagation mode, and means of light extraction (13) communicating with a part at least of the converting means and generating means, included between the first and second mirrors, and arranged in the periphery of the converting and generating means to extract out of these at least a part of photons in the guided mode.

2. A device according to claim 1, characterised in that said extracting means (13) are realised at least in a part of the first (14) and/or second (5) mirrors and/or of the generating means (6,8) and/or of the converting means (7), in the form of a diffracting tridimensional structuration with dimensions selected based on at least the wavelength of the photons in the guided mode.

3. A device according to claim 2, characterised in that said structuration substantially defines a photonic quasi-crystal of holes or columns constituting diffracting elements, with dimensions of about the wavelength of photons in the guided mode.

4. A device according to claim 3, characterised in that said quasi-crystal is a tiling of convex substantially jointed polygons and sharing each of their edges with an unique neighbour, said size of the edges being substantially equal to a selected average value, with a percentage close to within approximately +15% and -15%.

5. A device according to claim 4, characterised in that said tiling is constituted of substantially equal proportions of

squares and equilateral triangles, or of first and second angular rhombs with different apexes, with substantially equal-sized edges.

6. A device according to claim 4, characterised in that said tiling is constructed by periodisation of a pattern including a selected number of equilateral triangles and squares, or first and second angular rhombs with different apexes.

7. A device according to claim 4, characterised in that said tiling is constructed by Stampfli inflation of a pattern comprising a selected number of equilateral triangles and squares, or first and second angular rhombs with different apexes.

8. A device according to claim 4, characterised in that said tiling is constructed by a substantially random distribution of selected proportions of equilateral triangles and squares, or of first and seconds angular rhombs with different apexes.

9. A device according to one of claims 4 to 8, characterised in that said tiling is twisted so as to surround at least partly said generating means (6,8) and said converting means (7).

10. A device according to one of the claims 4 to 9, characterised in that said tiling is curved so that it can extend over at least a part of an annular area.

11. A device according to one of claims 4 to 10, characterised in that said quasi-crystal is a tiling in which at least one of the diffracting elements is omitted so as to form a structure of the amorphous type.

12. A device according to one of the claims 1 to 11, characterised in that the first mirror (14) is of the semi-reflective type and constituted by an interface between a layer of the generating means (8) and a layer of another material.

13. A device according to claim 12, characterised in that said other material is selected from a group comprising air, epoxy and a material forming the substrate.

14. A device according to one of the claims 1 to 13, characterised in that the second mirror (5) is a reflective mirror of the Bragg's mirror type placed on a substrate.

15. A device according to one of the claims 1 to 14, characterised in that the converting means (7) and a part at least of the generating means (6,8) are constituted of materials selected from a group comprising semiconductors and organic electroluminescent materials.

16. A device according to claim 15, characterised in that said organic materials are selected from a group comprising organic polymers, conjugated or not, and organometallic complexes.

17. A device according to claim 15 characterised in that said semiconductors are selected from a group comprising silicon, gallium-, aluminium-, indium-, nitrogen-, phosphorus-, arsenic- and antimony-based compounds, as well as their alloys.

18. A device according to one of claims 15 and 17, characterised in that it is constituted i) of an ordered stacking of GaAs substrate (4), alternating layers of GaAs and AlAs forming said second mirror (5), a n doped GaAs layer (6), forming a part of the generating means, an active layer (7) constituted of two AlGaAs barriers framing a quantic well in InGaAs and forming said converting means, a n doped GaAs layer (8) forming another part of the generating means as well as said first mirror (14) with a layer of outer air, and ii) of a first means of electric contact (10) to enable the p doped GaAs layer (8) to be placed under a positive polarisation and a second means of electric contact (9) suitable to place the n doped GaAs layer (6) to be placed under a negative polarisation.

19. A device according to one of claims 1 to 18. characterised in that the first (14) and second (5) mirrors define an asymmetric magnetogenic cavity, in particular of the Fabry-Pérot type.

20. A device according to one of the claims 1 to 18, characterised in that the first (14) and second (5) mirrors define an antimagnetogenic cavity with the wavelength of the photons emitted by the converting means (7).

21. An electroluminescent diode, characterised in that it comprises a device (1) according to one of the previous claims.